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EXAMINER	
DEPPE, BETSY LEE	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/613,825	BOESEL ET AL.	
	Examiner	Art Unit	
	Betsy L. Deppe	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-21 and 23-31* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/2/03 & 2/27/08* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed February 27, 2008 have been fully considered.

2. The following rejections in the Office Action mailed September 28, 2007 are withdrawn:

a. the rejection of claims 12, 19 under 35 USC 112, first paragraph; and

b. the rejection of claims 3, 7, 19, 24, 25 under 35 USC 112, second paragraph.

3. The rejection of the other claims is not withdrawn as explained below.

4. Applicant's argument regarding the rejection of claim 3 under 35 USC 112, first paragraph (see page 12) is not persuasive. The applicant argues that the accumulating step may define the demodulation step because accumulating the correlated components into the second memory element provides a particular correlated multi-path element from the signal. It is still unclear how the iteratively accumulating step "defines" a demodulation operation since the detailed description does not describe "defining" a demodulation operation.

The applicant also argues that it would be clear to one skilled in the art that the amount of correlated components would determine the amount of processing

necessary. However, it is unclear what information is used from the signal and how the amount of processing changes based on this information since the detailed description does not describe varying the amount of demodulation processing.

Therefore, the rejection of claim 3 under 35 USC 112, first paragraph is not withdrawn.

5. Applicant's argument regarding the rejection of claim 4 under 35 USC 112, first paragraph (see page 12) is not persuasive. The applicant cites paragraphs [0042]-[0046] as providing support for the claim language. However, these paragraphs appear to be describing the dynamic processing ability of the processor 20, i.e. a single processing unit, whereas claim 4 recites that a determination varies dynamically between "processing ***units***" (*emphasis added*).

Furthermore, it is unclear how determination of multi-path components varies dynamically between processing units, e.g. how does the determination step change for each processing unit. Therefore, it is unclear how determining multi-path components vary dynamically between processing units and the rejection of claim 4 under 35 USC 112, first paragraph is not withdrawn.

6. Applicant's argument regarding the rejection of claims 6 and15 under 35 USC 112, first paragraph (see page 12) is not persuasive. The applicant cites paragraphs [0058]-[0065] as providing support for the claims language. However, these paragraphs describe despreading signal and accumulating them in a buffer, not “performing

searching and channel estimating…while simultaneously operating on the digital samples of the original frequency" as recited in claim 6, lines 5-7 and claim 15, 6-8. Therefore, the argument is not persuasive and the rejection is not withdrawn.

7. Applicant's argument regarding the rejection of claim 13 under 35 USC 112, first and second paragraphs (see pages 13 and 16) is not persuasive. Since claim 13, line 1 recites "further comprising," the recited limitations are interpreted as being additional to those limitations recited in claim 7. Therefore, it is not clear from the language of claim 13 that the recited elements comprise the plurality of buffers recited in claim 7 and the rejection is withdrawn.

If the limitations of claim 13 comprise the “plurality of buffers” in claim 7, line 3, then “further comprising" should be "wherein the plurality of buffers comprises" assuming that all the elements in claim 13 (e.g. the permutation block) are also part of the “plurality of buffers” recited in claim 7.

8. Applicant's argument regarding the rejection of claim 14 under 35 USC 112, first paragraph (see page 13) is not persuasive. The detailed description does not describe “selecting” the permutation block (86) as recited. Paragraphs [0080]-[0082] describes providing separate data to the searcher and to the demodulator. However, it does not describe “selecting” the permutation block since it appears that the permutation block itself is not being selected. This rejection can be overcome by clarifying that ***data*** from the permutation block is selected.

9. Applicant's argument regarding the rejection of claim 20 under 35 USC 112, first paragraph (see page 14) is not persuasive. The claims language (i.e. "adaptable") suggests the despreader is modified or adapted for different sample rates and symbol times. However, as the applicant acknowledges, the functionality despreader is not affected by a clock (e.g. sample rates and symbol times). Therefore, it is unclear how to provide a despreader that can be adapted for arbitrary sample rates and symbol times, as recited in claim 20, lines 4-5 and the rejection is not withdrawn.

10. Applicant's argument regarding the rejection of claim 21 under 35 USC 112, first paragraph (see page 14) is not persuasive. Paragraph [0064] describes weighting a value and accumulating in the symbol buffer according to the given equations. However, it does not describe ***dynamically selecting*** an algorithm for accumulating via the channel estimate. Therefore, the rejection is not withdrawn.

11. Applicant's argument regarding the inconsistency between claim 7 and the detailed description (see page 15) is not persuasive. The Examiner agrees that the weighting element and the accumulator may process the same signal (e.g. a despread energy), i.e. in parallel, as recited in the claims. However, the detailed description and Figures 7 and 13 describe and show, respectively, a weighting element (i.e. the multiplier for receiving signals from despreader 56 and channel estimator 58) providing a ***weighted*** despread signal to the accumulator (i.e. the adder and symbol buffer 54),

i.e. the weighting element and accumulator processes the despread in ***serial***. (See paragraph [0057]) Therefore, the argument is not persuasive and the rejection is not withdrawn. This rejection may be overcome by changing "the despread energy" in claim 7, line 9 to "the ***weighted*** despread energy."

12. Applicant's argument regarding the rejection of claim 12 under 35 USC 112, second paragraph (see page 15) is not persuasive. The applicant appears to be explaining what "timing hypothesis" is but does not point out language in the claim that indicates what signal is being correlated against the timing hypothesis. Therefore, the rejection is not withdrawn.

13. Applicant's argument regarding the rejection of claim 30 under 35 USC 112, second paragraph (see page 16) is not persuasive. Based on the claims language, it is unclear how the "demodulating" relates to the asynchronous processing. For example, is the demodulating part of the asynchronous processing or is it a separate step?

14. Applicant's argument regarding the rejection of claim 31 under 35 USC 112, second paragraph (see page 16) is not persuasive. The applicant indicates that "any step considered part of the demodulating process" may be done asynchronously. However, neither claims 30 nor 31 recite any steps for the "demodulating process" so that it is unclear what the applicant deems to be part of the demodulating process of the claimed invention.

The claims language must be clear so that the public is informed of the scope of the invention. Since a "demodulating process" may consist of a variable number steps and/or different steps and the claim does not recite any steps that the applicant regards as part of the demodulating process, the scope of the invention is not clear. Therefore, claim 31 is vague and indefinite and the rejection under 35 USC 112, second paragraph is not withdrawn.

15. In response to applicant's argument that Easton fails to disclose buffering samples in a first memory element and randomly accessing the digital samples, as recited in claim 1 (see page 17), Figure 2 of Easton et al. shows buffering the digital samples in a buffer 224 (i.e. a "first memory element" as recited) and discloses that the starting samples being processed can correspond to any location in the buffer (i.e. buffer is randomly accessed since it is not accessed in a particular order).

Furthermore, the applicant alleges that column 14, lines 26-40 discloses that the samples are sequentially retrieved. However, column 14, lines 26-40 describes sequentially ***processing*** the samples, not sequentially ***retrieving*** the samples from the buffer. Therefore, the argument is not persuasive and the rejection is not withdrawn.

16. In response to applicant's argument that Schlem et al. fails to disclose a weighting element that weights despread energy as recited in claim 7 (see page 18), Figure 2 of Schlem et al. discloses a weighting element (48) that weights a despread signal (i.e. "despread energy") that is generated by multiplier 40 and integrator 44. (See

also paragraph [0055]) Therefore, the argument is not persuasive and the corresponding rejections are not withdrawn.

Drawings

17. The drawings were received on February 27, 2008. These drawings are acceptable for purposes of overcoming the claim objections in paragraphs 5(b)-5(e) of the Office Action mailed September 28, 2007.

18. The drawings are objected to because they do not conform with 37 CFR 1.84(p) since the text and/or numbers in the drawings are less than 1/8 inch in height.

19. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s):

a. the power control or power controller, as recited in claims 8 and 25, respectively;

b. the accumulator that selectively "locates" into an output memory buffer or an intermediate results buffer, as recited in claims 11 and 29. Figure 10 shows an intermediate results buffer but not an output memory buffer;

c. the circuitry to perform searches for multi-path components by correlating against a timing hypothesis, as recited in claim 12; and

d. the plurality of distinct receiver RF chains, as recited in claim 17.

No new matter should be entered.

20. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

21. Claims 6 and 15 are objected to because of the following informalities: it appears that "second memory element" on line 4 should be "***first*** memory element" since claim 1 recites buffering the samples into a first memory element. Appropriate correction is required.

Claim Rejections - 35 USC § 112

22. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

23. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

24. Claims 3, 4, 6, 13-15, 20, 21 and 23-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

25. With regard to claim 3, the detailed description does not appear to describe ***how*** the accumulating step "defines a demodulation operation and comprises using information from the signal to determine an amount of demodulation processing to be performed" as recited in claim 3, lines 2-4. The description of Figures 7, 10 and 13 does not mention how a demodulation operation is "defined" by the accumulator in the respective figures. Furthermore, it is unclear how the iteratively accumulating step determines the "amount of demodulation processing." For example, what information is used to determine the amount of demodulation processing. Therefore, one skilled in the art is not enabled to make and/or use the claimed invention.

26. With regard to claim 4, the detailed description does not describe how the determination of multi-path components "varies dynamically between processing units."

For example, how does the determination step vary from one processing unit to another processing unit?

27. With regard to claims 6 and 15, the detailed description does not describe the step recited in claim 6, lines 6-8 and claim 15, lines 6-8. Although the detailed description describes storing samples from different frequencies in different buffers, it does not appear to describe performing searching and channel estimation while simultaneously operating on digital samples of a different frequency.

28. With regard to claim 13, the disclosure does not describe how the additional limitations in claim 13 interfaces with the elements in claim 7. For example, how does the data for the plurality buffers in claim 7 differ from the data for the buffers in claim 13? Furthermore, it is unclear how the searching element and demodulation element in claim 13 relate or interface with the elements in claim 7. Therefore, one skilled in the art is not enabled to make and/or use the claimed invention.

If the limitations of claim 13 comprise the “plurality of buffers” in claim 7, line 3, as suggested by the applicant’s argument, then “further comprising" should be "wherein the plurality of buffers comprises" assuming that all the elements in claim 13 (e.g. the permutation block) are also part of the “plurality of buffers” recited in claim 7.

29. With regard to claim 14, the disclosure does not describe how the permutation block is selected to provide correct timing. For example, how is the permutation block selected and how does the timing affect the permutation block? This rejection can be overcome by amending "the permutation block" to "the permutation block ***data***" in order to be consistent with paragraphs [008]-[0082].

30. With regard to claim 20, the detailed description does not describe a despreader that is “adaptable to arbitrary sample rates and symbol times” as recited on lines 4-5. For example, it is unclear how the despreader is ***adaptable*** in response to changes in the sample rate or symbol time since conventional despreaders despread the input signal without regard to the sample rate or symbol time.

31. With regard to claim 20, the detailed description also does not describe an accumulator that accumulates “based on the channel estimate from the channel estimator” (see lines 8-9) Based on the Examiner’s understanding of Figures 7 and 13, the channel estimate is used to weight the despread signal (see paragraph [0058]) and does not affect the functionality or operation of the accumulator.

32. With regard to claim 21, the detailed description also does not describe dynamically selecting an algorithm to accumulate the digital samples via the channel estimate.

33. Dependent claim(s) are rejected under the same ground(s) as the claim(s) from which they depend.

34. Claims 4, 6, 12, 13, 15, 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

35. In claim 4, it is unclear how the "determination of multi-path components" step and the “processing units” relate to the steps recited in claim 1. It is also unclear

whether the multi-path components in claim 4 are related to the multi-path component in claim 1.

36. In claims 6 and 15, it is unclear what is meant by “operating on the digital samples of the original frequency" on lines 7-8. For example, are the digital samples of the original frequency being buffered, accessed or accumulated as recited in claim 1?

37. With regard to claim 7, claim 7 is inconsistent with the detailed description since the recited weighting element and accumulator are both processing the same despread energy signal, i.e. the components are in parallel, whereas Figures 7 and 13 (and the corresponding description) show these components as being in serial. (See paragraph [0057]) This rejection may be overcome by changing “the despread energy” in claim 7, line 9 to “the ***weighted*** despread energy.”

38. With regard to claim 12, it is unclear what is being correlated "again a timing hypothesis." For example, is the composite signal, multi-path component or another signal being correlated “against a timing hypothesis"?

39. With regard to claim 13, it is unclear how the recited limitations interface with the limitations recited in claim 7. For example, it is unclear how the searching element and demodulation element in claim 13 relate or interface with the elements in claim 7.

If the limitations of claim 13 comprise the “plurality of buffers” in claim 7, line 3 (as argued by the applicant on page 13), then this rejection may be overcome by changing “further comprising" to "wherein the plurality of buffers comprises" assuming that all the elements in claim 13 (e.g. the permutation block, the searching element, the demodulation element) are also part of the “plurality of buffers” recited in claim 7.

40. With regard to claim 30, it is unclear what is meant by “wherein the CMDA-compliant waveform is processed asynchronously to a sample rate… and based on the program instructions in programmed memory." For example, how does the "demodulating" step relates to the asynchronous processing and the programmed instructions in programmed memory, i.e. is the demodulating part of the asynchronous processing or is it a separate step?

41. With regard to claim 31, it is unclear what is meant by “the entire demodulation processing is done asynchronously.” Since claim 30 recites a demodulating step without reciting any steps of “demodulation processing,” it is unclear what is covered by "the entire demodulation processing" such that one is apprised of the scope of the invention.

42. Dependent claim(s) are rejected under the same ground(s) as the claim(s) from which they depend.

Claim Rejections - 35 USC § 102

43. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

44. Claims 1, 2, 30 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Easton (US Patent No. 6,985,516 cited in the Office Action mailed April 17, 2007).

45. With regard to claims 1 and 2, Figures 2 and 5 of Easton disclose the claimed invention including buffering digital samples into a first memory element (224); randomly

accessing digital samples to correlate a particular multi-path component (522 and 224); and iteratively accumulating the correlated particular multi-path component into a second memory element (524 and 234). (See also column 3, lines 48-54; column 6, lines 36-59; column 14, lines 4-40; and column 16, lines 19-29)

46. With regard to claims 30 and 31, Easton discloses the claimed invention including demodulating a CDMA-compliant waveform wherein the waveform is processes asynchronously to a sample rate associated with the waveform and based on programmed instructions. (See column 2, lines 33-36 and 48-52; column 3, lines 56-57; and column 7, lines 21-22)

47. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Taniguchi et al. (US Patent No. 7,035,318 B2 cited in the Office Action mailed September 28, 2007). Figure 9 of Taniguchi et al. discloses the claimed invention including buffering samples into a first memory element (52); randomly accessing digital samples to correlate a particular multi-path component (60a and 60b); and iteratively accumulating the correlated multi-path component into a second memory element (60c and 61). (See also abstract; Figures 3 and 4; column 5, lines 42-46; column 6, lines 35-54; column 8, lines 33-44; and column 10, lines 39-62) Since the buffer is read non-sequentially (see column 8, lines 33-44), the circuit in Taniguchi et al. is randomly accessing the digital samples as recited in claim 1.

Claim Rejections - 35 USC § 103

48. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

49. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. as applied to claim 1 above, and further in view of Schlem et al. (US Pub. No. 2003/0235238 A1 cited in the Office Action mailed September 28, 2007). Taniguchi et al. discloses the claimed invention including demodulation via non-sequential access of digital samples from the first memory element. It is implicit that the data read from buffer section 52 based on the timing information of a particular multi-path component (see column 8, lines 33-44) is demodulated in order to recover the transmitted data. However, Taniguchi et al. does not teach performing channel estimation.

Figure 2 of Schlem et al. discloses weighting the despread signal in order to optimize data recovery. (See paragraph [0056]) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Schlem et al. and Taniguchi in order to improve data recovery by compensating for channel conditions that affect the quality of the received signal.

50. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Easton or Taniguchi et al. as applied to claim 1 above, and further in view of Butler et al. (US Patent No. 6,748,010 B1 cited in the Office Action mailed September 28, 2007). Easton and Taniguchi et al. each disclose the claimed invention except for tuning to a non-

original RF frequency, buffering digital samples while tuned at the non-original RF frequency, retuning the RF frequency to the original frequency, and performing search and channel estimation while operating on the digital samples of the original frequency.

Since Butler et al. discloses that CDMA communication systems use a pilot channel and a data/traffic channel (i.e. channels with different frequencies), it would have been obvious to one of ordinary skill in the art at the time the invention was made to tune or retune the receiver in Easton or Taniguchi et al. to the appropriate frequencies for receiving the pilot signal and data in order to accurately recover the transmitted data. Regardless of which frequency the receiver is tuned, the receiver buffers the digital samples. Furthermore, it is known in the art that pilot signal is commonly used for performing search and channel estimation.

51. Claims 7-10, 19-20 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al.

52. With regard to claim 7, Figure 9 of Taniguchi et al. discloses the claimed invention including buffers (52) switchable between a write state and a read state (Figure 3); a despreading element (60a and 60b); and an accumulator (60c) that iteratively accumulates into a buffer (61). (See also abstract; Figure 4; column 5, lines 42-46; column 6, lines 35-54; column 8, lines 33-44; and column 10, lines 39-62) Since the buffer is read non-sequentially (see column 8, lines 33-44), the circuit in Taniguchi et al. is randomly accessing the digital samples as recited in claim 7. However Taniguchi et al. does not teach a weighting element as recited in claim 7, lines 7-8.

Figure 2 of Schlem et al. discloses weighting the despread signal in order to optimize data recovery. (See paragraphs [0055]-[0056]) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Schlem et al. and Taniguchi in order to improve data recovery by compensating for channel conditions that affect the quality of the received signal.

53. With regard to claim 8, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for a power control as recited. Since power conservation is desirable in cellular communication devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a power control to power down after processing of desired multi-path components and power up when data is ready to be processed in order to minimize power consumption in the circuit disclosed by Taniguchi et al. in view of Schlem et al.

54. With regard to claim 9, Taniguchi et al. in view of Schlem et al. discloses the claimed invention including three physically separate buffers. However, Taniguchi et al. in view of Schlem et al. does not disclose that one buffer is for receiving data and that two buffers is for random access by correlator. It would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to designate the number of buffers for receiving data and for random access by the correlator based on the rate at which data is being stored and read for processing. The number of buffers allocated for writing to and reading from does not affect the functionality of the overall circuit.

55. With regard to claim 10, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for five separate buffers as recited. It would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to determine the number of buffers to use with a given number of the buffers designated for receiving data and for random access by the correlator based on the rate at which data is being stored and read for processing. The number of buffers and the specific allocation of these buffers for writing to and reading from do not affect the functionality of the overall circuit.

56. With regard to claim 19, Taniguchi et al. in view of Schlem et al. discloses the claimed invention including dynamically switching to optimal functionality based on channel estimates. (See Schlem et al., paragraph [0056])

57. With regard to claim 20, Taniguchi et al. discloses the claimed invention including a despreader (e.g. 54a and 54 b) that obtains samples from a first memory buffer (52) and an accumulator (e.g. 54c) that accumulates digital samples into a second buffer (e.g. 54d). (See also abstract; Figures 4 and 9; column 5, lines 42-46; column 6, lines 35-54; column 8, lines 33-44; and column 10, lines 39-62) Since the buffer is read non-sequentially (see column 8, lines 33-44), the circuit in Taniguchi et al. is randomly accessing the digital samples as recited in claim 20. However Taniguchi et al. does not teach a channel estimator.

Figure 2 of Schlem et al. discloses a channel estimator that provides a channel estimate of a multi-path component in order to optimize data recovery. (See paragraphs [0055]-[0056]) It would have been obvious to one of ordinary skill in the art

at the time the invention was made to combine the teachings of Schlem et al. and Taniguchi in order to improve the accuracy of the data recovery by compensating for channel conditions that affect the quality of the received signal.

58. With regard to claim 23, Taniguchi et al. in view of Schlem et al. discloses the claimed invention including a feedback loop wherein the data is read from the second memory buffer and used in the accumulation of the digital samples. (See Taniguchi et al., Figures 4 and 9)

59. With regard to claim 24, Taniguchi et al. in view of Schlem et al. discloses the claimed invention including accumulated digital samples comprise partially processed symbols. (See Taniguchi et al., Figures 4 and 9)

60. With regard to claim 25, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for a power controller. Since power conservation is desirable in cellular communication devices, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a power controller to toggle the circuit between an off state and an on state in order to minimize power consumption in the receiver disclosed by Taniguchi et al. in view of Schlem et al.

61. With regard to claims 26 and 27, Taniguchi et al. in view of Schlem et al. discloses the claimed invention including using a pilot symbol to determine the channel estimate. (See Schlem et al., paragraph [0055]) However, Taniguchi et al. in view of Schlem et al. does not disclose whether the pilot signal is a burst-pilot signal or a continuous-pilot signal. It would have been an obvious matter of design choice to implement the circuit in a system that used a burst-pilot signal or a continuous-pilot

signal since the type of pilot signal does not affect the operation or functionality of the apparatus. Furthermore, the applicant has not disclosed that using a particular type of pilot signal provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art would have expected applicant's invention to perform equally well with either type of pilot signal.

62. Claims 11 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al. as applied to claims 7 and 20, respectively, above, and further in view of Garyantes et al. (US Pub. No. 2001/0036195 A1 cited in the Office Action mailed September 28, 2007). Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for selectively storing the accumulated energy in an output memory buffer or an intermediate results buffer. Figure 1 of Garyantes et al. teaches storing the accumulated despread energy in an output memory buffer (10) or an intermediate results buffer (18). (See also Figure 2; and paragraphs [0011], [0012], [0044] and [0045]) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Garyantes with the receiver disclosed by Taniguchi et al. in view of Schlem et al. in order to have greater flexibility and control over when the results are processed or outputted.

63. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al. as applied to claim 7 above, and further in view of Butler et al.

64. With regard to claim 15, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for tuning to a non-original RF frequency, buffering digital samples while tuned at the non-original RF frequency, retuning the RF frequency to the original frequency, and performing search and channel estimation while operating on the digital samples of the original frequency.

Since Butler et al. discloses that CDMA communication systems use a pilot channel and a data/traffic channel (i.e. channels with different frequencies), it would have been obvious to one of ordinary skill in the art at the time the invention was made to tune or retune the receiver in Taniguchi et al. in view of Schlem et al. to the appropriate frequencies for receiving the pilot signal and data in order to accurately recover the transmitted data. Regardless of which frequency the receiver is tuned, the receiver buffers the digital samples. Furthermore, it is known in the art that pilot signal is commonly used for performing search and channel estimation.

65. With regard to claim 16, Taniguchi et al. in view of Schlem et al. and Butler et al. discloses the claimed invention since it would have been obvious to one of ordinary skill in the art at the time the invention was made for the buffering means maintain the digital samples from the non-original RF frequency in order to save the digital samples for subsequent processing if necessary.

66. Claims 17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al. as applied to claims 7 and 20, respectively, above, and further in view of Easton et al.

67. With regard to claim 17, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except for means for processing a plurality of sets of digital samples from a plurality of distinct receiver RF chains.

Easton et al. discloses a receiver that stores a plurality of sets of digital samples from a plurality of distinct receiver RF chains in a buffer. (See column 6, line 36-39) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Easton with the teachings of Taniguchi et al. in view of Schlem et al. in order to improve data recovery by using diversity (via a plurality of distinct receiver chains) in the receiver.

68. With regard to claim 28, Taniguchi et al. in view of Schlem et al. discloses the claimed invention except that the digital signals stored in the first memory buffer are not communicated in a multiple transmit, multiple receive antenna scheme. Since it is well-known to apply transmit diversity to mitigate the effects of multi-path fading, it would have been an obvious matter of design choice to apply the circuit disclosed by Taniguchi et al. in view of Schlem et al. in a multiple transmit antenna scheme in order to further reduce the effects of multi-path fading. Furthermore, the source or cause of the multi-path components does not affect the operation or functionality of the receiver.

Since Easton et al. teaches applying a multiple receiver antenna scheme to a CDMA receiver (see column 6, line 36-39), it would have been obvious to one of ordinary skill in the art at the time the invention was made to also apply a multiple receiver antenna scheme to the receiver disclosed by Taniguchi et al. in view of Schlem et al. in order to improve data recovery by using also diversity in the receiver.

69. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al. as applied to claim 7 above, and further in view of Subrahmanya et al. (US Pub. No. 2003/0128678 A1 cited in the Office Action mailed September 28, 2007) Taniguchi et al. in view of Schlem et al. discloses the claimed invention including a receiver that processes multi-path components. (See Taniguchi et al., column 1, lines 7-12).

Since Subrahmanya et al. teaches using transmit diversity in a CDMA system (see paragraph [0006]), it would have been an obvious matter of design choice to apply the receiver of Taniguchi et al. in view of Schlem et al. to a system with transmitter diversity in order to further combat the effects of multi-path components. Since the receiver of Taniguchi et al. in view of Schlem et al. inherently processes signals having a plurality of multi-path components (see Taniguchi et al., column 1, lines 7-12), the source or cause of the multi-path components (e.g. via transmitter diversity) does not affect the operation or functionality of the disclosed receiver.

70. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. in view of Schlem et al. as applied to claims 7 and 20, respectively, above, and further in view of Subrahmanya et al. and Easton et al. Taniguchi et al. in view of Schlem et al. discloses the claimed invention except that the digital signals stored in the first memory buffer are not communicated in a multiple transmit, multiple receive antenna scheme.

Since Subrahmanya et al. teaches using transmit diversity in a CDMA system (see paragraph [0006]), it would have been an obvious matter of design choice to apply the receiver of Taniguchi et al. in view of Schlem et al. to a system with a multiple transmit antenna scheme in order to further combat the effects of multi-path components. Furthermore, since the receiver of Taniguchi et al. in view of Schlem et al. inherently processes signals having a plurality of multi-path components (see Taniguchi et al., column 1, lines 7-12), the source or cause of the multi-path components (e.g. via transmitter diversity) does not affect the operation or functionality of the disclosed receiver.

Since Easton et al. teaches applying a multiple receiver antenna scheme to a CDMA receiver (see column 6, line 36-39), it would have been obvious to one of ordinary skill in the art at the time the invention was made to also apply a multiple receiver antenna scheme to the receiver disclosed by Taniguchi et al. in view of Schlem et al. and Subrahmanya et al. in order to improve data recovery by using also diversity in the receiver.

Conclusion

71. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

72. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Wednesday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Betsy L. Deppe/
Primary Examiner, Art Unit 2611